

## REPORT

ON THE

## SMALL-POX EPIDEMIC, 1871-73,

AS OBSERVED IN

## CORK-STREET FEVER HOSPITAL.

BY

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Reprinted from the Dublin Journal of Medical Science—July, 1873.

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PRINTED FOR THE AUTHOR

BY JOHN FALCONER, 53, UPPER SACKVILLE-STREET, DUBLIN.

1873.

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I CONSIDER this a suitable time to take a general review of the small-pox epidemic 1871-'72, and '73, as a whole, especially as it affected this hospital. The small-pox epidemic of 1871, '72, and '73, has been one of the severest which has visited Dublin during the present century; it can rank only after the great fevers of 1826 and 1847, and the cholera epidemics of 1832 and 1849. The cases of cholera during the epidemic of 1866, the last great visitation which fell upon Dublin, numbered about 2,500, with 1,186 deaths; while the late cases of small-pox must have numbered 12,000, probably 15,000, and the disease caused 1,647 deaths in the Dublin registration district, in the years 1871 and '72. The number of those who were affected by the disease, and who (together with their friends) were obliged to apply to the Mansion House Relief Committee, reached 6,000, which represents an almost incalculable amount of misery.

TABLE I.

*Showing the Admissions of Small-pox Patients per month into Cork-street Hospital during the years 1871-72-73, compared with the Meteorological conditions during the same period.*

1	2	Meteorological Conditions						
		Mean Bar. 3	Mean Temp. 4	Mean Dry B. 5	Mean Wet B. 6	Mean Humi- dity 7	Rain- fall 8	Rainy Days 9
		Inches	Deg.	Deg	Deg.	Per cent	Inches	
1871								
February, - -	1	29·847	45·3	47·0	44·7	83·3	1·648	16
March, - - -	1	29·908	45·6	47·5	44·4	78·8	0·815	12
April, - - -	7	29·705	48·7	50·5	47·6	81·2	3·162	20
May, - - -	5	30·065	52·6	55·8	51·4	73·5	0·378	9
June, - - -	7	29·924	56·0	58·3	54·4	77·0	2·265	16
July, - - -	1	29·734	59·2	61·1	57·2	77·8	4·391	28
August, - - -	4	29·951	60·8	63·1	59·2	78·0	1·065	12
September, - -	8	29·887	53·6	55·2	52·2	81·0	4·048	13
October, - - -	41	29·829	50·7	52·3	49·9	83·5	2·917	16
November, - -	59	29·986	42·6	43·7	41·5	83·3	1·258	14
December, - -	78	30·003	41·4	42·2	39·9	82·1	0·797	15
1872								
January, - - -	81	29·405	41·6	42·4	40·4	84·5	2·864	23
February, - - -	90	29·616	45·2	46·0	43·9	84·2	2·557	20
March, - - -	97	29·698	45·1	46·3	43·7	80·7	2·419	21
April, - - -	65	29·914	47·3	49·2	45·3	74·0	2·655	12
May, - - -	59	29·919	49·3	51·1	47·1	74·0	2·164	22
June, - - -	64	29·825	55·2	57·5	53·5	76·0	3·276	19
July, - - -	34	29·926	61·2	63·4	58·4	72·1	1·098	12
August, - - -	16	29·967	58·9	60·7	56·7	76·8	4·302	17
September, - -	7	29·801	54·8	56·2	53·2	80·7	2·464	22
October, - - -	7	29·660	46·5	47·9	45·4	81·8	3·421	22
November, - -	3	29·578	43·6	44·9	42·5	82·1	3·414	24
December, - -	8	29·464	41·4	42·5	40·8	86·5	4·932	24
1873								
January, - - -	2	29·550	42·2	42·9	40·7	83·0	2·650	21
February, - - -	1	30·160	37·1	38·4	36·0	79·8	0·925	8
March, - - -	—	29·792	42·0	43·4	40·9	80·7	2·391	22
Total, - - -	746							

The meteorological data, furnished by Dr. J. W. Moore, and given in columns 3, 5, 6, and 7, are the results of observations taken daily at 9 a.m., 3 p.m., and 9 p.m. The mean temperature given in column 5 is deduced from the daily maximal and minimal temperatures in the shade. The rainfall is the monthly total of daily readings taken at 9 a.m., and a "rainy day" is one on which at least ·01 of an inch of rain is collected within 24 hours. The barometer readings are corrected and reduced to 32° at mean sea level.

From the foregoing table it will be seen that the epidemic commenced in February, 1871, but only attained considerable

proportions in October of the same year. It reached its height in March, 1872, and immediately began to fall until August, 1872, when a substantial decrease may be said to have taken place. A few cases, however, continued to drop in until February of 1873, after which the epidemic became absolutely extinct. Dr. J. W. Moore, Assistant Physician to the Hospital, has kindly furnished records of the meteorological conditions which prevailed during the period of the epidemic, which will prove of considerable interest, especially showing, as they do, how the epidemic reached its height in the cold winter weather, a circumstance observed in nearly all great small-pox epidemics. This is probably owing to the propagation of the disease by overcrowding and bad ventilation, which of course prevail to a greater extent in winter than in summer.

The first case was admitted into hospital on the 26th of February, 1871, from 2, Barry's-court, and died on March 4th. This was the first death registered in Dublin during the epidemic. Table I. gives by months the admissions during this epidemic, and this may be fairly taken as a measure of the rise and fall of the epidemic. Although at one time cases had to be refused, owing to want of accommodation, yet these were comparatively so few that the variations in the rate of admissions measure, as always in epidemics of contagious fevers in Dublin, the variations in the epidemic. It may here be remarked that not a single bed for the accommodation of fever patients was closed in consequence of the great pressure from small-pox, which may therefore be looked upon as altogether extra work for the officers, extra trouble in management, and extra expenditure for the institution. The total number of cases treated was 746; of these 563 recovered, and 162 or 21·6 per cent. died, and one patient was removed from hospital while still suffering from the disease. Comparing this with the mortality in other institutions we find that in the

Cork-street Fever Hospital, the rate was	21·6
Hardwicke, . . . . .	20·0
Cork, . . . . .	22·5
London Small-pox and Vaccination Hospital,	18·8
Hampstead (London) Fever Hospital,	19·4
Homerton (London) . . . . .	16·3

From this it appears that the mortality with us has been a little



higher than the Hardwicke, and a little lower than the Cork Hospital; but it seems remarkable that these three Irish hospitals have a higher mortality than the London hospitals, and that vaccination does not altogether account for the difference is shown by this list:—

	General Per cent. Mortality	General Per cent. Vaccination
Cork-street, . . . . .	21·6	81·8
Hardwicke, . . . . .	20·0	83·7
Cork, . . . . .	22·5	68·1
London (Small-pox), . . . . .	18·8	91·5
Hampstead (Fever), . . . . .	19·4	79·4
Homerton, . . . . .	16·3	67·0

If we take the Hardwicke, Cork-street, and Hampstead Hospitals we find that the per centage of vaccinated cases is nearly the same, and the per centage mortality is also nearly the same.

The localities from whence the cases came were those which usually furnished cases of fever, and the following lists give some of the more remarkable streets, with the number of cases furnished by each.

Francis-street, seventeen cases from sixteen houses, eight of which are known fever nests.

Bride-street, sixteen cases.

Meath-street, fifteen.

Cork-street, fifteen. No. 12 furnished three cases.

Townsend-street, fourteen.

Golden-lane, fourteen. No. 7 furnished four cases, No. 9 two cases, and No. 5 two cases.

Bishop-street, twelve, all from different houses.

Coombe, fourteen. No. 28 furnished three cases.

Patriek-street, twelve from ten houses, eight of which are noted fever houses.

King-street, ten. The first case in this street came from Drogheda.

Chancery-lane, ten.

Cuffe-street, nine cases. No. 25 furnished three cases, and several others occurred in the house.

Essex-street, West, nine. No. 11 furnished three cases.

Plunket-street, nine. No. 24 furnished three cases, one of which was malignant. This is a well-known fever house.

South Gloucester-street, seven cases. No. 2 furnished three cases.

New-row South, seven.

Aungier-street, seven. No. 39 furnished four eases.

Charlemont-street, six.

Mercer-street, six.

Newmarket, six.

Brown-street, six.

Fishamble-street, five.

M'Guinness's-place, five. These were all furnished by well-known fever houses.

Bow-lane, five. No. 8 furnished four of these.

Cook-street, five.

Corn-market, five.

Pitt-street, five.

I wish here to refer to Darby-square, which, although it furnished but two eases to the hospital, was severely visited by the disease, and is a well-known hot-bed for contagion. Also to 18, Ardee-street, which is continually on the hospital books as a fever haunt, and in this epidemic furnished no less than seven eases to our wards, while many more eases occurred in the house.

William's-place, Long-lane, is also worthy of note; from these little cottages we had four eases, all from different houses, all severe, three of them being malignant; the fourth confluent; all died. Cholera prevailed here in 1866, and we have frequently eases of fever from this place.

The eases admitted belong to three varieties, under which all the tables have been arranged. These varieties are *confluent*, the term being used in the ordinary sense, that is where confluence occurs on the face; *discrete*, where there is no confluence; and *malignant*, by which is meant those eases where the eruption is black, owing to the effusion of blood under the skin, or into the vesicles, and where there is also hæmorrhage from some one or more of the orifices of the body.

The three varieties were distributed as shown in Table II.

TABLE II.

Varieties	Number of Cases	Proportion per cent. of all the cases	Recovered	Died	Mortality per cent.
Discrete -	460	61·8	453	7	1·6
Confluent -	237	31·7	124	113	47·6
Malignant -	49	6·5	7	42	85·7
Total -	746	100·0	584	162	21·6

By far the most important question in connexion with small-pox is the influence which vaccination has upon the prevalence, spread, progress, nature, and mortality of the disease. As to the prevalence and spread of the disease, these are questions outside a detailed consideration in this report, but I may refer to the opinion expressed, that vaccination has no influence on the prevalence or spread of small-pox, an opinion which is still held, I am sorry to say, by some, in spite of all evidence to the contrary. That vaccination does not entirely prevent the disease, is, unfortunately, but too evident from the extent of the recent epidemic in this city, but the influence of vaccination in modifying it, and in diminishing the mortality, is clearly shown in Table IV. The relation between the mortality of the vaccinated and unvaccinated is shown in Table III.

TABLE III.

HOSPITALS	MORTALITY PER CENT.		
	Vaccinated	Unvaccinated	General
Cork-street - - - -	10·8	71·8	21·6
Hardwicke - - - -	11·2 <sup>a</sup>	78·57 <sup>a</sup>	20·0 <sup>a</sup>
Cork - - - -	5·5	58·0	22·5
London Small-pox - - -	14·9	66·2	18·8
Hampstead (London) - - -	11·4	51·2	19·36
Homerton - - - -	5·9	37·7	16·3

The difference in total mortality between the Cork-street and Hardwicke hospitals might at first seem remarkable, the former being higher than the latter; but it will be seen that in *each* class the Cork-street mortality is lower than the Hardwicke. The apparent difference is caused by the vaccinated cases being more numerous (83·7 per cent.) in the latter than in the former (81·8 per cent.). From this table it will be seen that of the vaccinated cases only 10·8 per cent. died, while of the unvaccinated 71·8 died. If each class be taken separately a similar result is shown in even a more striking manner (*vide* Table IV.).

<sup>a</sup> From Return of Board of Superintendence.



TABLE IV.

	DISCRETE			CONFLUENT			MALIGNANT			TOTAL		
	Total	Died	Per cent. Mortality	Total	Died	Per cent. Mortality	Total	Died	Per cent. Mortality	Total	Died	Per cent. Mortality
Vaccinated -	443	1	0·2	143	46	32·2	25	18	72	611	65	10·8
Unvaccinated -	17	6	35·1	94	67	71·2	24	24	100	135	97	71·8
Total -	460	7	1·6	237	113	47·6	49	42	85·7	746	162	21·6
Per cent. vaccinated in each class -	96·3			60·4			51·9			81·8		

Of the vaccinated cases in the discrete variety, the mortality was practically nothing (0·2 per cent.), but one patient having died. In that case the patient had inflammation of the lungs, probably quite independent of the small-pox. Of the unvaccinated, however, in this class, 35·1 per cent. died. In the confluent cases the mortality among the vaccinated was 32·2 per cent., while among the unvaccinated it was as high as 71·2 per cent. In the malignant or purpuric variety, the mortality among the vaccinated was 71·8 per cent., or about the same as in the unvaccinated confluent variety; while in this variety *not one* unvaccinated case recovered. It may be merely a coincidence of per centage mortality, but it is a remarkable fact that in the cases under consideration vaccination reduced the mortality of confluent cases to that of discrete unvaccinated, and that of malignant to that of confluent unvaccinated cases. The proportion of vaccinated to unvaccinated cases in each variety is considerably greater, except in the malignant variety, where the proportions are nearly equal. The difference is most remarkable in the discrete variety, where the number of unvaccinated cases is very small; in other words, vaccination *prevented* a large number of these cases from being confluent.

As to the nature of the vaccination marks, whether good or bad, I have not been able to find that there was any relation between the nature of the mark and the severity of the disease. In the commencement of the epidemic we tried to note the difference between good and bad marks, but soon gave it up as

impracticable. In many of the confluent cases we could tell nothing about the matter, and in the discrete cases there seemed to be little difference between them. I believe one cause of this is, that a perfectly successful vaccination, which has thoroughly affected the system, may have its after appearance so modified by local causes as to alter what should have been a good mark into a very bad one. As to the number of marks, we had but few cases where there were more than two, except in the re-vaccinated cases, which I shall mention presently. In all those where there were but two marks these had been produced at the time of the primary vaccination, either by two primary vaccinations or by test vaccination. Of re-vaccinated cases, properly so called, we had but four. Two of these were brothers, one of whom had been re-vaccinated twice, and the other once; both of them had purpuric small-pox, and both died, showing some extraordinary family peculiarity. Of the other two, one was doubtful and the other so remarkable that I will give the particulars. A male child, aged six weeks, who had not been vaccinated, was admitted: his mother had been successfully re-vaccinated about three weeks before; also his sister, aged thirteen. In order to secure proper attention to the baby, the sister was admitted to nurse him. This she did, sleeping with him at night, and carrying him in her arms all day, until his death, on the eighth day. Then the sister fell sick, and had the initiatory fever of the disease, and five modified vesicles appeared on her face and two on her chest; she was confined to bed only for four days. I need scarcely point out that the exposure to contagion in this case was almost such as to preclude escape from infection, and I believe, but for the re-vaccination, this girl would have suffered terribly.

As there were many thousands of persons re-vaccinated at the Dublin dispensaries, if re-vaccination had not been an almost certain preventive of small-pox, we could scarcely have been without many more cases occurring in vaccinated persons. There were several cases of so-called re-vaccination, where the operation must have been performed after the invasion of the disease, all these cases proved fatal, and I have published an account of them in the *British Medical Journal*, August 31st, 1872. There were three patients said to have been re-vaccinated. One of these I had little doubt of, as she was an old nurse in a family where I had attended a small-pox patient, whom she nursed, and for whom she washed. Her attack was slight, and the eruption was almost confined to the

wrists, which had been chapped during the cold weather. Two patients had been previously affected by small-pox, one of them having had confluent small-pox, and in consequence was deeply pitted. They were both mild cases, but one, a patient whom I had once treated for fever, and who had chronic disease of the spine, was very slow in recovery.

The number of cases in each class and the influence of sex are shown in Table V.

TABLE V.

SEX	DISCRETE			CONFLUENT			PURPURIC			TOTAL			
	Total	ied	Per cent. Mortality	Total	Died	Per cent. Mortality	Total	Died	Per cent. Mortality	Total	Recovered	Died	Per cent. Mortality
Males -	261	3	1.1	132	61	46.2	27	23	85.2	420	333	87	20.7
Females	199	4	2.0	105	52	50.0	22	19	86.3	326	251	75	23.0
Total -	460	7	1.6	237	113	47.6	49	42	85.7	746	584	162	21.6

From this it appears that there were considerably more males than females treated during the epidemic, and I believe there were really more males than females affected in Dublin, but as we had greater accommodation for males, and as the young male children were treated in female wards, our statistics cannot be considered to throw much light upon the relative influence of sex in this disease. The mortality among females is higher (23 per cent.) than among males (20.7 per cent.) This is true not only of the total mortality, but also of the mortality in each class, as shown by the table, it being slightly higher for females than males. Not only was the mortality among females greater than among males, but also the severity of the disease was greater, the proportion of confluent cases being larger, as shown by Table VI.

TABLE VI.

	MALES.			FEMALES		
	Total	Confluent	Per cent.	Total	Confluent	Per cent.
Vaccinated - - -	338	76	22.5	273	67	24.2
Unvaccinated - - -	82	56	68.3	53	38	71.7
Total - - -	420	132	31.4	326	105	32.2

Even vaccination was less protective against confluence in the females than in the males. This is remarkable, as in every other institution of which I have had an opportunity of examining the statistics, the reverse is the case, the mortality among males being the higher.

The ages of the patients, and the mortality at each age, are shown in Table VII.

TABLE VII.

Ages	Total	Per cent. at each Age	Vaccinated	Per cent. Vaccinated	Died	Mortality per cent.
Under 5 - - -	26	3.5	10	38.5	16	61.5
5, and under 10 - -	54	7.2	39	72.2	14	25.9
10, „ 15 - -	133	17.9	116	87.2	22	16.5
15, „ 20 - -	210	29.5	181	86.2	25	11.9
20, „ 30 - -	239	32.0	199	83.3	53	24.3
30, „ 40 - -	45	6.0	35	77.8	14	31.1
40, „ 50 - -	29	3.8	22	75.9	11	37.9
50, and upwards - -	10	1.3	9	90.0	2	20.0

From this it appears that the most fatal age is under five years, and the least fatal between fifteen and twenty. Of those above fifty the mortality is low, but the number of cases is too small to draw any positive conclusion from. The difference in mortality at different ages does not depend altogether on the proportion of vaccinated cases at these ages, the proportion being about the same at all ages between ten and thirty.

There were nine cases in children under one year, of these three were vaccinated.

One male, aged four days, vaccinated on day of death, purpuric, died.

One female, aged seven months, vaccinated, discrete, recovered.

One female, aged five months, vaccinated, discrete, taken away by mother; probably recovered. Of unvaccinated cases there were:—

One male, aged six weeks, confluent, died.

One male, aged seven weeks, discrete, recovered. This child's



mother was re-vaccinated shortly before its birth. Vaccination took well, and probably affected the child previous to birth.

One male, aged six months, confluent, died.

One female, aged seven months, discrete, died.

One female, aged two weeks, unvaccinated, discrete, died.

One female, aged three months, confluent, recovered.

Of the complications that arises those of the respiratory organs were the most frequent and fatal; in fact inflammation of the respiratory passages was the common cause of death early in the disease except in the purpuric cases. The most important affection of the respiratory organs was laryngitis, which was more or less present in all confluent cases, and proved fatal in many. The first indication of this affection was hoarseness, followed in the severer cases by sudden attacks of difficulty of breathing when drinking. The sudden difficulty of respiration while the patient was taking a drink, or, as the nurses say, "going against his breath," was a sign of serious import, and in the large proportion of cases indicated a fatal termination. This must be distinguished from a difficulty of swallowing, owing to tenderness of the throat from presence of the eruption in the fauces. In all severe cases there was considerable bronchitis. In a few cases there was pneumonia, or inflammation of the lungs; in one, otherwise mild, case, pneumonia proved fatal; but in this, probably the pneumonia was not a result of, but a prior condition to the small-pox. Pleuritis occurred in several cases, and in one proved fatal. Two patients, who previously had pulmonary consumption, had mild attacks of small-pox, and both recovered. Several cases had pericarditis, and all recovered; two of them were severe cases, having had confluent small-pox. It is remarkable in how few cases were the eyes severely affected, and in not one case was the sight lost. All the confluent cases had more or less inflammation of the conjunctivæ, but in only one case did serious damage result. In one child under my own care, the eyes were severely affected, so much so, that I fear had the poor child recovered she would have been blind; but this being a bad confluent case (unvaccinated, and in a child of only four years), proved fatal. It is worthy of remark that in all the cases (with few exceptions) where the eye affections were troublesome or tedious, the patient had previously sore eyes—or "weak eyes," as they generally said—in fact, ophthalmia. I believe the reason why small-pox proved less destructive to the eyes in the past than in previous epidemics is that ophthalmia had become less common than formerly. The affection



of the nose can scarcely be looked upon as a complication, although sometimes troublesome ulcerations followed the disease. The mouth was usually affected by the eruption, and in some cases the sores remained for a long time, seriously impeding convalescence in one case. In a girl who had a tedious convalescence, a large ulcer about three-fourths of an inch in diameter remained in the centre of the tongue for nearly three weeks, and when healed left a hard white cicatrix. The sores on the skin in this instance were unusually slow in healing. Salivation with or without swelling of the salivary glands occurred in all the confluent, and in many discrete cases. Those cases where the swelling of these glands was considerable, were usually favourable in the result.

In some the ears were affected by inflammation; and suppuration of the internal ear occurred, destroying the hearing, but in no case was the power of hearing lost in both ears. In most cases the ear affection came on towards the close of the acute stage of the disease, or after the acute stage had subsided, as a sequela, at the same period as boils and abscesses, which were frequent but not serious sequelæ.

The affections of the nervous centres were not very troublesome; as a rule the chief complications of this kind were delirium and headache, which were always present in the confluent cases, scarcely ever in the discrete, and seldom in the purpuric cases—the absence of delirium in the latter class was very remarkable, considering the severity of the disease. The delirium was usually not dangerous, but troublesome, the patients insisting on wandering about, but generally returning to bed quietly, when ordered to do so; however, there were several cases of a serious character, when the patients attacked their nurses and fellow-patients in a savage way. One patient succeeded in securing the door of the ward against the nurse, breaking the window-bars and sashes, and jumping from the window, all in the space of a few minutes. One night, when visiting the hospital at eleven o'clock, p.m., at the height of the epidemic, I found no less than six delirious and dangerous patients all attempting to escape, attacking the nurses and porters. After an hour's work, with the assistance of the apothecary, I succeeded in getting them to bed in a comparatively quiet state. Such patients were generally found to have been of intemperate habits, and generally suffered from great debility. Special complications were not common. A few were attacked with cerebro-spinal meningitis, and at least two died from this affection; the cases otherwise not being severe. Stomach and bowel complications were not usually severe.

The vomiting which usually ushered in the disease was sometimes persistent, but never serious. Diarrhœa sometimes proved severe, but in no case did it seem to be the material cause of death. In only a few cases did it threaten the lives of the patients.

Bed-sores were not of as frequent occurrence as might have been expected, but in several cases where they did occur, the sloughing was most extensive, and the cases terminated fatally. Two instances were especially remarkable: in one of these the sloughing covered an enormous surface of the back; in another, a purpuric case, extensive sloughing took place after but two days' residence in hospital, but here there was also mortification of the legs; in neither of these cases could the sloughing be called ordinary bed-sores. Gangrene, or mortification, complicated some cases; in general this was of a superficial character, especially in the soft part of the fingers and toes; but in one or two instances it was deeper; one patient, a baker, under my own care, lost two toes by this complication; and in the fatal purpuric class gangrene seemed to be always more or less present. In one instance scarcely any part escaped except the trunk and features of the face; the hands and arms, feet and legs, nose and ears, and genital organs, all fell into a state of mortification; the patient turned absolutely black; almost all the entire peeled from him, and he exhaled a horrible stench; dark streams of blood exuded from several parts, and he bled from all orifices of the body. He was of extremely intemperate habits. I had twice treated him for delirium tremens, and once for typhus fever; he was drunk when admitted, but retained consciousness to the last. Several cases were complicated by pregnancy, and of those who were confined during the disease all but one died. One woman in the eighth month of pregnancy passed safely through an attack of severe discrete small-pox. All the children died. One woman came under my care who had been confined before admission. This was a severe case, with serious uterine hæmorrhage, but no black spots. She recovered after a tedious convalescence. I have since heard that she died in her next confinement, eleven months after her discharge from hospital.

